

*Blair*

ENGINEERING REPORT

for

CONTRACT NUMBER DACW-33-81-D-0005  
WORK ORDER NUMBER 0007

SUBSURFACE INVESTIGATION

COASTAL FLOOD STUDY  
REVERE, MASSACHUSETTS

AUGUST 24 THROUGH SEPTEMBER 3, 1982



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**BRIGGS**

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## 1.0 GENERAL

### 1.1 Authorization

The work reported herein was performed under Contract DACW 33-81-D-0005, Work Order Number 0007, dated 19 August 1982. The authority for this project was derived from Public Law 80-858, Section 205, of the 1948 Flood Control Act.

### 1.2 Project Site

The site is located in Revere, Massachusetts. The project site encompasses approximately 4,500 ft of shore line, between Carey Circle and the General Edwards Bridge, on the Point of Pines (see Figure 1).

### 1.3 Purpose

The purpose of this work was to determine the subsurface conditions so as to design the foundation for repairing and/or replacing the flood wall at the project site.

### 1.4 Scope of the Investigation

Inspection and exploration instructions, which were provided by the Army Corps of Engineers, New England Division, are included in Appendix A. The project subsurface investigation employed test borings, radar and resistivity testing techniques.

The boring program consisted of drilling eight test borings at the locations shown on the Boring Location Plan (Figure 1). The borings were located along the shore line between 2.8 and 8.0 ft above mean sea level (M.S.L.). Continuous drive sampling using a solid-barrel sampler was performed at 5-foot intervals to a maximum depth of 30 ft below the existing ground surface. The field exploration logs are included in Appendix B.

## 2.0 SUBSURFACE CONDITIONS

### 2.1 Subsurface Materials

The following subsurface materials were encountered when the borings were drilled at the site.

- a. Miscellaneous Fill, up to 5 ft in thickness at boring FD 82-2 was encountered at the surface. The Gravelly Sand fill consists of concrete fragments from demolition of a restuarant previously at this location.

- b. Tidal Deposits of Gravel and Sand, between 15 and 30 ft of Gravelly Sand, Sand with Gravel Layers and Sand was encountered at the surface or beneath the miscellaneous fill at boring location FD 82-2. The material was generally clean with a small amount of shell fragments and less than 10 percent nonplastic fines.
- c. Silty Clay, underlies the noncohesive tidal deposits in all borings except boring FD 82-6, where only Sand was encountered, and extends to the maximum depth explored (30.0 ft).

## 2.2 Groundwater

Groundwater was encountered between 3.0 and 4.0 ft below the existing ground surface at borings FD 82-2 and FD 82-6, respectively. These values, and values at other boring locations are subject to tidal fluctuations and local anomalous conditions such that groundwater observations taken during the drilling operations were considered inaccurate or as tidal.

## 3.0 QUALITY CONTROL

### 3.1 General

All work was conducted in accordance with the procedures outlined in the Inspection and Exploration Instructions. The equipment utilized by Briggs Engineering & Testing Co. to perform the required drilling work is described below. All equipment was in satisfactory working condition at the start of the project work.

- a. Core Drill: The core drill used was a modern, hydraulically-driven, rotary-head unit manufactured by Acker Drill Company.
- b. Truck Mounted Cathead: A pickup truck using a, power take off, rear mounted cathead with the drilling tripod attached to the truck body.
- c. Drive Hammer: The drive hammer used to advance the solid-barrel sampler weighed approximately 300 pounds.
- d. Casing and Rods: NW (3-0 in. I.D.) flush joint casing was used to keep the borehole open. AW-size drill rods were used in washing out the borehole and driving the solid-barrel sampler.
- e. Samplers: The equipment employed to obtain soil samples was a 2-inch I.D. by 63-inch solid-barrel sampler with a ball check head and spring-type retainer.

### 3.2 Records

NED Forms 58 and 58A, dated March 1971 and entitled "Field Log of Test Boring" were used to record pertinent drilling and sampling data. The logs include the following:

- a. Site location, boring location, and number.
- b. Make and model of drilling equipment.
- c. Type of drilling and sampling operation by depth.
- d. Depths at which soil samples were recovered, including top and bottom depth of each run. Classification or description of the soil samples obtained. Penetration resistance given in blows per 12 in. of penetration for driving the solid-barrel sampler.
- e. Length of sample of soil recovered per sampling run.
- f. Depth at which groundwater is encountered.

### 3.3 Procedures

- a. Boreholes were advanced by driving a 2-inch I.D. by 63-inch solid-barrel sampler below the bottom of the casing or washed hole into undisturbed soil by the impact of a hammer weighing approximately 300 pounds falling 18 inches. Refusal was defined as 100 blows with no penetration or bouncing refusal.
- b. The sample spoon shoes were kept reasonably sharp at all times. Dull, bent, or otherwise damaged samplers were not used. Following sampling, the casing was advanced and cleaned out using appropriately sized roller bits, or chopping bits.
- c. Samples were classified in the field immediately following the taking of the sample. Classification was in accordance with ASTM D-2487 and D-2488. Representative samples were taken from each soil sampling run and placed in 16 oz. glass jars with hermetically sealed lids. Jars were labeled with sample number, sampling interval, boring number, date, location, and soil description. A chain of custody log was maintained documenting custody of the samples between the field and transportation and delivery to the laboratory at NED.

### **3.4 Safety**

The work was performed without personal injury or accident. The geotechnical inspector conducted weekly safety briefings. The Safety Reports are attached to this report.

### **3.5 Survey**

Boring elevations were determined using a hand level from elevation points as shown on the site plan provided by the Corps of Engineers.

### **3.6 Reflection Survey**

Radar and resistivity techniques were employed by Weston Geophysical to delineate the subsurface conditions within the project site between boring locations. A separate report will be submitted by Weston Geophysical containing their findings.

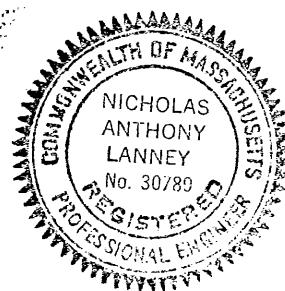
## **4.0 QUALITY CONTROL CERTIFICATION**

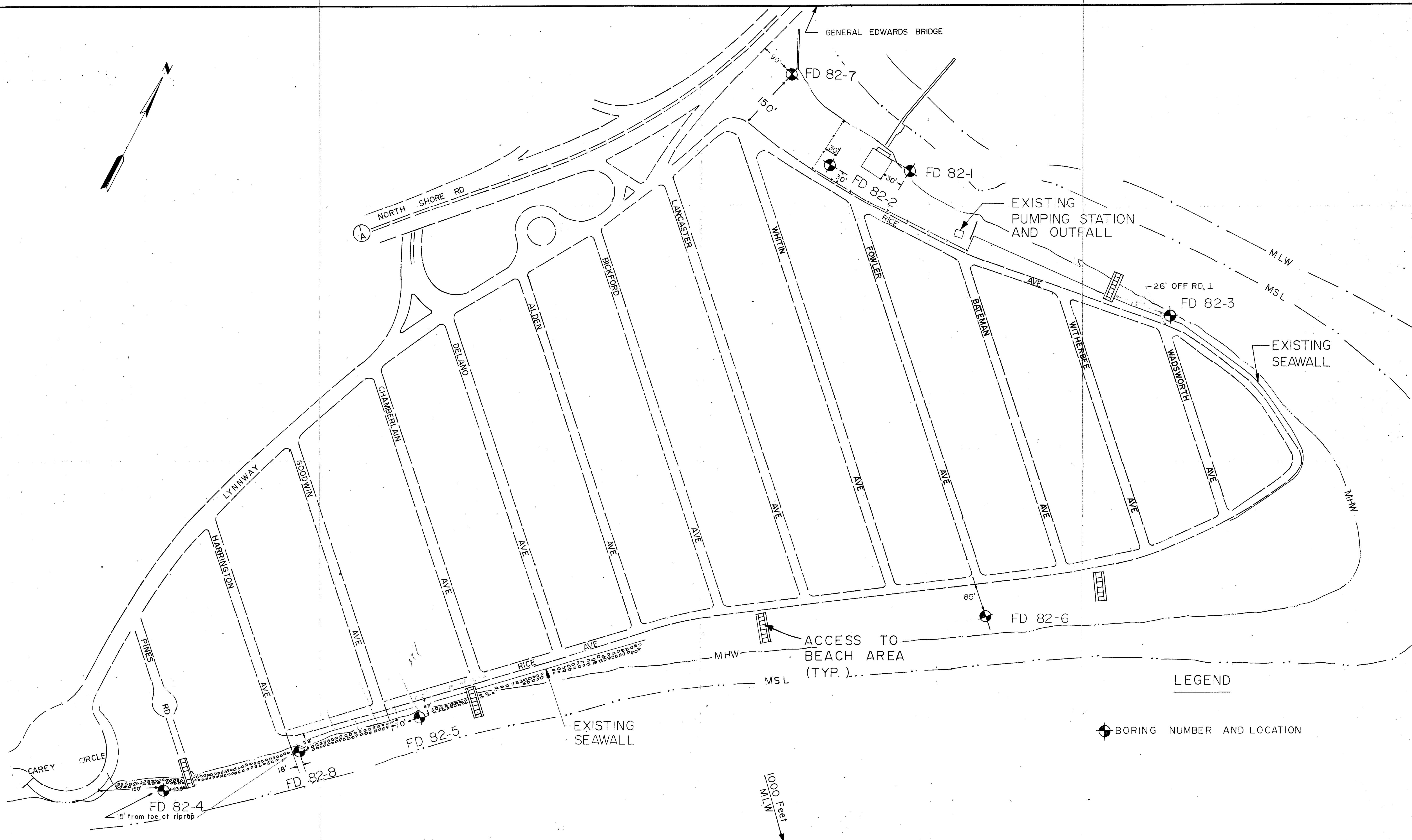
I hereby certify that the above mentioned records, equipment, and procedures were used to perform the subsurface exploration described herein. I also certify that the work was performed in a professional manner and meets the requirements set forth in the work order.

CERTIFIED 14 September 1982

*Nicholas A. Lanney*

Nicholas A. Lanney, P.E.  
Massachusetts No. 30789





BRIGGS ENGINEERING & TESTING CO.  
164 WASHINGTON ST. NORWELL, MA.

TITLE: BORING LOCATIONS, POINT OF PINES  
REVERE, MA.  
SCALE: 1" = 100' DATE 13 SEPT 82  
DRAWN: J.S.D. CHECKED: R.E.H.

SHEET 1 of 1

BRIGGS ENGINEERING CORPORATION

WEEKLY SAFETY MEETING

TO: Safety Office, NED

FROM: Field Engineer

Date held 8-24-82

THRU: Project Engineer

Time 0700

Weekly safety meeting was held this date for the following personnel:  
Contract No. DACW 33-81-D-0005 Personnel present: Richie Jones  
Work Order No. 007 Charles Reil  
Conducted By: R.F. Bukoski

1. Subjects discussed (Note, delete, or add):

- x Individual Protective Equipment -  
Prevention of Falls -
- x Safe Lifting Techniques -  
Emergency Communications -  
Fire Prevention -  
Sanitation, First Aid -  
Tripping Hazards - trash, hose, nails in lumber -  
Staging, Ladders, Concrete Forms -  
Hand Tools -  
Portable Power Tools -  
Woodworking Machinery -  
Equipment Maintenance (Zero defects) -
- x Hoisting Equipment -
- x Ropes, Hooks, Chains and Slings -  
Electrical Grounding, Temporary Wiring -  
Lockouts for safe clearance procedures -  
Electrical, pressure, moving parts -  
Welding -  
Excavations -  
Loose Rock and Steep Slopes -  
Explosives -  
Water Safety -  
Other -

Prepared by: Ronald F. Bukoski  
Field Engineer

2. Exposure:

No previous exposure, start of new work order.

Signature:

Nicholas Loney  
Project Engineer

3. Forwarded: NED, Waltham, MA

BRIGGS ENGINEERING CORPORATION

WEEKLY SAFETY MEETING

TO: Safety Office, NED

FROM: Field Engineer

Date held 8-30-82

THRU: Project Engineer

Time 0700

Weekly safety meeting was held this date for the following personnel:  
Contract No. DACW 33-81-D-0005, Personnel present: Jeff Mullen  
Work Order No. 007 Keith McAuliffe  
Conducted By: R.F. Bukoski

1. Subjects discussed (Note, delete, or add):

- Individual Protective Equipment -
- Prevention of Falls -
- Safe Lifting Techniques -  
Emergency Communications -
- Fire Prevention -
- Sanitation, First Aid -
- Tripping Hazards - trash, hose, nails in lumber -
- Staging, Ladders, Concrete Forms -
- Hand Tools -
- Portable Power Tools -
- Woodworking Machinery -
- Equipment Maintenance (Zero defects) -
- Hoisting Equipment -
- Ropes, Hooks, Chains and Slings -  
Electrical Grounding, Temporary Wiring -  
Lockouts for safe clearance procedures -  
Electrical, pressure, moving parts -
- Welding -
- Excavations -
- Loose Rock and Steep Slopes -
- Explosives -
- Water Safety -
- Other -

Prepared by: Ronald F. Bukoski  
Field Engineer

2. Exposure:

Exposure for the week of 8-23-82, covering three men for a total  
of 66 man-hours.

Signature:

Michael A. Larney  
Project Engineer

3. Forwarded: NED, Waltham, MA

BRIGGS ENGINEERING CORPORATION

WEEKLY SAFETY MEETING

TO: Safety Office, NED

FROM: Field Engineer

Date held 9-7-82

THRU: Project Engineer

Time 0700

Weekly safety meeting was held this date for the following personnel:  
Contract No. DACW 33-81-D-0005 Personnel present: \_\_\_\_\_  
Work Order No. 007 \_\_\_\_\_  
Conducted By: R.F. Bukoski \_\_\_\_\_

1. Subjects discussed (Note, delete, or add):

Individual Protective Equipment -

Prevention of Falls -

Safe Lifting Techniques -

Emergency Communications -

Fire Prevention -

Sanitation, First Aid -

Tripping Hazards - trash, hose, nails in lumber -

Staging, Ladders, Concrete Forms -

Hand Tools -

Portable Power Tools -

Woodworking Machinery -

Equipment Maintenance (Zero defects) -

Hoisting Equipment -

Ropes, Hooks, Chains and Slings -

Electrical Grounding, Temporary Wiring -

Lockouts for safe clearance procedures -

X Other - Comments by R. Poisson on 30 August 1982:

1. Fire Extinguisher
2. Nut on Tripod Bolt

Prepared by: Ronald F. Bukoski

Field Engineer

2. Exposure:

Exposure for the week of 8-30-82, covering three men for a total of 68 man-hours. Field work completed on 9-3-82.

Exposure for Weston Geophysical personnel on 8 and 9 September 1982, covering 2 men for a total of 40 man-hours. Field work was completed on 9 September 1982.

Signature:

Michael A. Farney  
Project Engineer

3. Forwarded: NED, Waltham, MA

## BRIGGS ENGINEERING CORPORATION

## Chain of Custody Log

Project: Subsurface Investigation: Coastal Flood Study  
Revere, Massachusetts

<u>Items:</u>	Tubes	<u>None</u>
	Bottles	<u>None</u>
	Jar Samples	<u>70</u>
	Core Boxes	<u>None</u>
	Sampling Logs	<u>Borings FD 82-1, FD 82-2, FD 82-3,</u> <u>FD 82-4, FD 82-5, FD 82-6, FD 82-7, FD 82-8</u>

<u>Date &amp; Time Received</u>	<u>Date &amp; Time Transferred</u>	<u>Comments</u>	<u>Custodian</u>
<u>as sampled</u>	<u>9-8-82 0830</u>		<u>Paul Buhai</u>
<u>9-8-82 0830</u>	<u>9-8-82 1140</u>		<u>Steve McKey</u>
			<u>OK</u> <u>Chris Turek</u>

**APPENDIX A: INSPECTION AND EXPLORATION INSTRUCTIONS**

GEB REQUISITION #82-47

INSPECTION AND EXPLORATION INSTRUCTIONS

ATTACHMENT NO.1

PROJECT: Revere Coastal Flood Protection Study, Massachusetts, Pt. of Pines

SITE: Revere, MA - Pt. of Pines - From Carey Circle to General Edwards Bridge

AUTHORITY: Section 205 of 1948 Flood Control Act (PL 80-858)

PURPOSE: The subsurface investigations are for determining the subsurface conditions so as to design the foundation for repairing and/or replacing the flood wall at the project site.

SCOPE OF INVESTIGATION

1. The work to be performed is separated into three sections: seismic survey, drive sample borings, and undisturbed soil sampling. The seismic survey and drive sample borings need not be performed separately.
2. The seismic survey will consist of approximately 4,500 lineal feet of reflection survey along the existing wall as shown on attachment No.2. The main purpose of the survey is to determine the thickness of the organic layer which is expected within the foundation area. The seismic line shall be located using features from the existing flood wall. The plan of the seismic line shall include distant measurements to existing features from noted seismic stations. The seismic profiles shall show the seismic stationing along with the elevation in MSL and the delineation of the various zones and their velocities.
3. Eight drive sample borings using a 300 lb. hammer with an 18-inch drop shall be performed at the location shown on Attachment No. 2. The explorations shall go to a maximum depth of 30 feet. Refusal is not expected to be encountered within this zone, but if a refusal (100 blows with no penetration or bouncing refusal) is encountered, the hole shall be moved laterally five feet and driven again. Only one move per hole will be authorized unless otherwise directed by project engineer. The project engineer shall be contacted at the start of FD-82-6 so that a site visit may be arranged to locate the undisturbed sampling bore holes and depths.
4. The undisturbed boring shall be as located by Corps of Engineers personnel during the before mentioned site visit. The samples shall be 5 inch diameter, 30 inch long. The materials to be sampled will basically be organics.
5. The drive sample and undisturbed explorations shall be inspected full time by a Geotechnical Engineer. The Geotechnical Inspector shall also inspect the seismic work if it is performed simultaneously. Top elevations shall be obtained to within ±0.5 feet using elevation points as shown on Attachment No. 2.

6. Sample delivery shall be within two working days after completion of the field work. Three copies of the draft report shall be postmarked no later than the seven calendar days after completion of field work.

#### SITE CONDITIONS

The site is located in Revere, MA between Carey Circle and the General Edwards Bridge. It is approximately parallel to Rice Ave. The expected foundation conditions are a sand overlain by a layer of organics with bedrock over 100 feet deep. The surface is expected to have a low bearing capacity. The area to be investigated is trafficked by beach goers during good weather. Portions of the area are within the tidal range.

#### RIGHTS OF ENTRY

Rights of entry shall be obtained by Corps of Engineers personnel.

#### COORDINATION

The Project Engineer shall be Mr. R. Poisson, 617-647-8396. Mr. Poisson shall be contacted at the start of FD-82-6 so that a site visit to locate the undisturbed explorations may be arranged. Sample delivery shall be coordinated with Mr. Michael Carroll at 647-8392.

#### EXPLORATION NUMBERS

The exploration locations are designated using letters on Attachment No. 2. The holes shall be numbered FD-82-1 through FD-82- consecutively in their order of completion. The undisturbed sampling holes shall be numbered UD-82- . The undisturbed hole numbers shall be the same as its adjacent pilot hole.

**APPENDIX B: FIELD LOGS OF TEST BORINGS**

U.S. ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION

Site BUHLER, MA

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FIELD LOG OF TEST BORING

Co-ordinates: N NOT GIVEN

E

Elevation Top of Boring	<u>5.5'</u>	M.S.L.	Hammer Wt.	<u>300 lbs</u>	Boring Started	<u>8-24-82</u>
Total Overburden Drilled	<u>30.0</u>	Feet	Hammer Drop	<u>18</u>		
Elevation Top of Rock	<u>NONE ENCOUNTERED</u>	M.S.L.	Casing Left	<u>NONE</u>	Boring Completed	<u>8-24-82</u>
Total Rock Drilled	<u>0</u>	Feet	Subsurface Water Data		Page	
Elevation Bottom of Boring	<u>-24.5'</u>	M.S.L.	Obs. Well	<u>NO</u>	3.2' TIDAL	
Total Depth of Boring	<u>30.0</u>	Feet	Drilled By	<u>BRIGGS ENGINEERING &amp; TESTING CO.</u>		
Core Recovered	<u>N/A</u> %	No. Boxes	Mfg. Des. Drill	<u>ACKER</u>		
Core Recovered	<u>N/A</u> Ft.	Diam. In.	Inspected By:	<u>RONALD F. RUKOSKI</u>		
Soil Samples	<u>2-0</u>	In. Diam.	Classification By:	<u>RONALD F. RUKOSKI</u>		
Soil Samples	<u>1-3/8</u>	In. Diam.	Classification By:			

0900 hrs

DEPTH $1' = 1.0'$	CORE/SAMPLE		BLOWS PER FT. CORE REC'DY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO.	SIZE			
1.0	S-1	2-0"	0.0	7	DOVE 2-0" I.D. X 5-0' SOLID BARREL SAMPLER FROM GROUND SURFACE TO 5.0' USING 300 lb HAMMER DROPPED 18".
2.0	1 JAR	2-0"	TO 5.0'	22	RECOVERED 26-0"
3.0				36	DOVE 3-0" CASING FROM 0' GROUND SURFACE TO 5.0' <sup>0'</sup>
4.0				23	WASHED OUT CASING USING ROLLER ROCK BIT.
5.0				18	
6.0	S-2	2-0"	5.0	17	DOVE 2-0" I.D. X 5.0' SOLID BARREL SAMPLER FROM 5.0 TO 10.0' USING 300 lb HAMMER DROPPED FROM 18".
7.0	1 JAR	2-0"	TO 10.0'	18	RECOVERED 19-0".
8.0				21	DOVE 3-0" CASING FROM 5.0' TO 10.0' AND WASHED OUT USING ROLLER ROCK BIT.
9.0				21	
10.0				25	

GENERAL REMARKS: BORING DEPTHS ARE REFERENCED TO  
EXISTING GROUND SURFACE ELEVATION.

Site REVERE, MA					Boring No. FD 82-1	Page <u>2</u> of <u>3</u>
DEPTH 1'-10'	CORE/SAMPLE NO.	CORE SIZE 2-0"	DEPTH ft. 100' TO 150'	BLOWS per ft. 9, 11, 19, 24, 27, 9, 11, 16, 20, 22, 7, 13, 21, 30, 39, 7, 11	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
11.0	S-3 1 JAR	2-0"	100' TO 150'	9, 11	DROVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 100 TO 150' USING 300 LB HAMMER. RECOVERED 27-0"	SAND WITH PEAT LAYERS, THIN, DISPERSE LAYERS, LESS THAN 1/8" THICK OF PEAT FINE MEDIUM TO FINE SAND, < 2% NONPLASTIC FINE, < 5% SHELL FRAGMENTS, MODERATE ORGANIC ODOR, <u>DARK GRAY, (SP LAYERS PT.)</u> <i>(SILT, CLAY, SAND)</i>
12.0				19		
13.0				24		
14.0				27		
15.0						
16.0	S-4 1 JAR	2-0"	150' TO 200'	9, 11	DROVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 150 TO 200' USING 300 LB HAMMER DROPPED 18".	SAND, WIDELY SPACED PEAT LAYERS, 4" LAYER - MEDIUM GRAVEL SIZE PARTICLES INTERSPERSED IN SAND FINE MEDIUM TO FINE SAND, < 5% SHELL FRAGMENTS, < 5% MEDIUM TO FINE GRAVEL, SLIGHT ORGANIC ODOR, GRAY, (CD WITH PT.). <i>(SILT, CLAY, SAND)</i>
17.0				16	RECOVERED 31-0".	
18.0				20	DROVE 3-0" CASING FROM 150 TO 200' AND WASHED OUT USING ROLLER PACK BIT.	
19.0						
20.0				22		
21.0	NO SAMPLE TAKEN		200' TO 250'	7, 13	DROVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 200 TO 250' USING 300 LB HAMMER DROPPED 18".	NO SAMPLE TAKEN BETWEEN 20.0 AND 22.0'. LITTLE RECOVERY, MOSTLY DISTURBED FROM WASH, SAME SAND AS ABOVE.
22.0					RECOVERED 36"	
23.0	S-5 2 JARS	2-0"	220' TO 250'	21, 30	DROVE 3-0" CASING FROM 200 TO 250' AND WASHED OUT USING ROLLER PACK BIT.	SILT CLAY, MODERATE PLASTICITY MOTTLED BROWN AND GRAY 25% PEAT INTERSPERSED, MODERATE DEY STRENGTH, (CL).
24.0				39		
25.0	S-6 1 JAR	1-1/8"	250' TO 300'	7	DROVE 2-0" I.D. SOLID SPOON SAMPLER FROM 250 TO 300' NO RECOVERY - VERY STEEP CLAY TRAP BROKEN OFF WHILE DRIVING. DROVE 1-1/8" I.D. SPLIT-BARREL SAMPLER FOR RECOVERY.	SILT CLAY, SAMPLE S-6 SAME AS SAMPLE S-5. (CL-CH) w/ H.F.
26.0				11		

25/5/2018

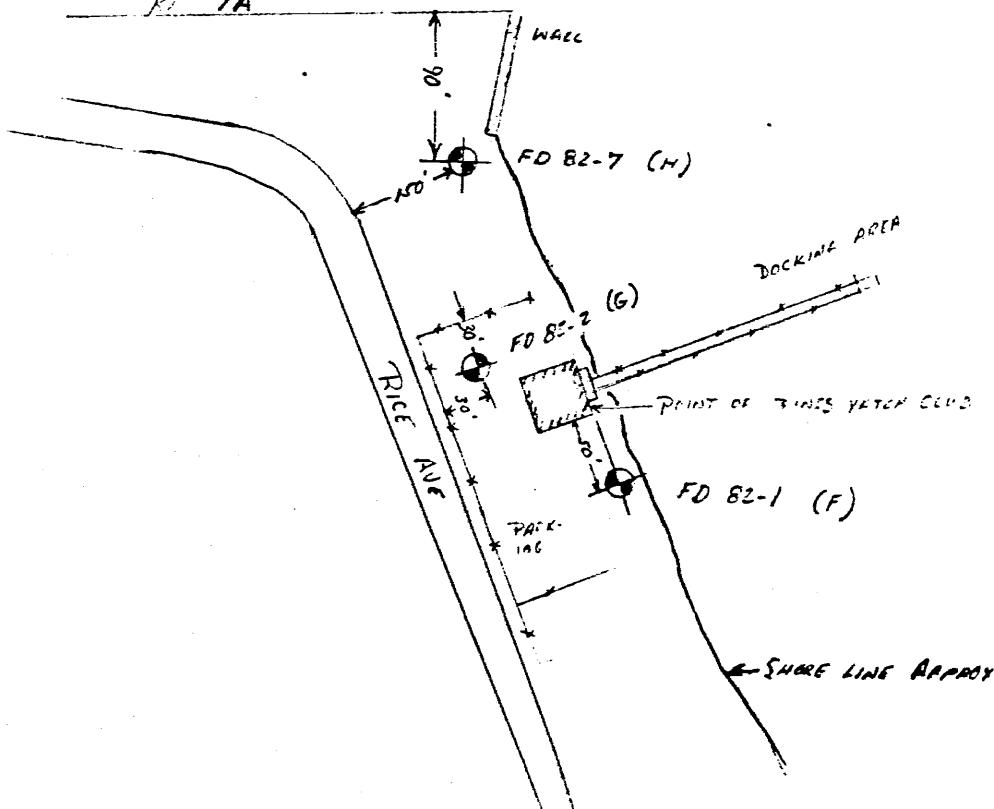
Boring No. FD 83-1  
20516 E

Site: REVERE, MA  
Boring No: FD 82-1

## SUBSURFACE WATER OBSERVATIONS

Note: Depths are in feet below original ground

### BORING LOCATION SKETCH



U. S. ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION

Site TRINITY MA

Page 1 of 3 Pages

FIELD LOG OF TEST BORING

Co-ordinates: N NOT GIVEN

E

Elevation Top of Boring	<u>8.0</u>	M.S.L.	Hammer Wt.	<u>300 lb</u>	Boring Started	<u>8-24-82</u>
Total Overburden Drilled	<u>30.0</u>	Feet	Hammer Drop	<u>18"</u>		
Elevation Top of Rock	<u>None Encountered</u>	M.S.L.	Casing Left	<u>None</u>	Boring Completed	<u>8-25-82</u>
Total Rock Drilled	<u>- 0 -</u>	Feet	Subsurface Water Data		Page	
Elevation Bottom of Boring	<u>- 22.0 '</u>	M.S.L.	Obs. Well	<u>No</u>	3.0' TIDAL	
Total Depth of Boring	<u>30.0</u>	Feet	Drilled By	<u>BRIGGS ENGINEERING &amp; TESTING CO.</u>		
Core Recovered	<u>N/A</u> %	No. Boxes	Mfg. Des. Drill	<u>ACKER</u>		
Core Recovered	<u>N/A</u> Ft.	Diam. — In.	Inspected By:	<u>RONALD F. BUKOSKI</u>		
Soil Samples	<u>2-0</u>	In. Diam. <u>10</u> No.	Classification By:	<u>RONALD F. BUKOSKI</u>		
Soil Samples		In. Diam. — No.	Classification By:			

DEPTH $1^{\prime} = 1.0'$	CORE/SAMPLE		BLOWS PER FT. CORE REC'DY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO.	SIZE DEPTH RANGE			
1	S-1 1 JAR	0.0	7	DOVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 0.0 TO 5.0' USING 300 lb HAMMER DROPPED 18"	SURFACE: YACHT CLUB PARKING AREA - 3/8" CRUSHED STONE
2	S-1A 1 JAR	2-0" 5.0'	33	SMALL BULDER ENCOUNTERED BETWEEN 1 AND 2'. RECOVERED 23-0"	MISCELLANEOUS FILL: GRAVELY SAND, 20-30% COARSE TO FINE GRAVEL AND CONCRETE FRAGMENTS, <10% NONPLASTIC FINES, DAMP, GRAYISH, (SP-SM).
3			10	DOVE 3-0" CASING FROM 0.0 TO 5.0' AND WASHED OUT USING ROLLER ROCK BIT.	S-1A: BOTTOM 4" OF RECOVERED SAMPLE GRAVELLY SAND, 10-20% MEDIUM TO FINE SUBANGULAR GRAVEL, COARSE TO FINE SAND, MOSTLY MEDIUM TO FINE, <10% NONPLASTIC FINES, DAMP, GRAYISH (SP-SM).
4			10		
5			15		
6			9	DOVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 5.0 TO 10.0' USING 300 lb HAMMER DROPPED 18"	MEDIUM TO FINE SUBANGULAR GRAVEL, COARSE TO FINE SAND, MOSTLY MEDIUM TO FINE, <10% NONPLASTIC FINES, DAMP, GRAYISH (SP-SM).
7	S-2 1 JAR	2-0" 10.0'	19	RECOVERED 23-0".	SAND WITH GRAVEL LAYERS, 3" SEAMS OF MEDIUM TO FINE GRAVEL AT ± 12", FINE MEDIUM TO FINE SAND, <5% NONPLASTIC FINES, MONT, GRAY, (SP).
8			24		
9			33	DOVE 3-0" CASING FROM 5.0 TO 10.0' AND WASHED OUT USING ROLLER ROCK BIT.	
10			26		

GENERAL REMARKS: BORING DEPTHS ARE REFERENCED TO EXISTING GROUND SURFACE ELEVATIONS.

S1101

FIEVERE, NF

Boring No. FD 82-2

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DEPTH DOWNS ON THERM	DEPTH NO.	CORE/SAMPLE NAME	SIZE INCHES	DEPTH REACH	BLOWS PER FT. CORE REC'D.	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
						DROVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 10.0 TO 15.0' USING 300 16 HAMMER DROPPED 18". RECOVERED 28-0".	SAND, FINE MEDIUM TO FINE SAND, <10% THIN ORGANIC SEAMS OR FIBERS, <10% NONPLASTIC FINES, (SP-SM).
11				10.0	11		
	S-3		2-0"	TO	15		
12	1 JAR			15.0'			
					24		
13						DROVE 3-0" CASING FROM 10.0 TO 15.0' AND WASHED OUT USING ROLLER ROCK BIT.	
14					22		
					28		
15							
	S-4		2-0"	15.0	5	DROVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 15.0 TO 20.0' USING 300 16 HAMMER DROPPED 18".	SAND, FINE MEDIUM TO FINE SAND, <5% ORGANIC SEAMS, FIBERS OR SHELL FRAGMENTS, <10% NON- PLASTIC FINES, GRAY, (SP-SM).
16	1 JAR			TO	3		
				20.0			
17					9	RECOVERED 22 1/2" <sup>30</sup>	
18					12	DROVE 3-0" CASING FROM 15.0 TO 20.0' AND WASHED OUT USING A ROLLER ROCK BIT.	
19					17		
20							
8-25-82							
	S-5		2-0"	20.0	7	DROVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 20.0 TO 25.0' USING 300 16 HAMMER DROPPED 18".	SAND, MEDIUM TO FINE SAND, <5% FINE GRAVEL AND SHELL FRAGMENTS, <10% Non- PLASTIC FINES, GRAY (SP-SM).
21	1 JAR			TO	9		
				23.5			
22					10	RECOVERED 36"	
						CHANGE IN MATERIAL	
23					19	APPROXIMATELY AT 23.5'	
	S-5A		2-0"	23.5			
24	2 JARS			TO	31	DOVE 3-0" CASING FROM 20.0 TO 23.0' AND WASHED OUT USING FISHTAIL BIT.	SILTY CLAY, MODERATELY PLASTIC, <5% TEXT & FIBRE INTERCHANGED, MODERATE DRY STRENGTH, MOTTLED GRAY AND BROWN, (CL).
				25.0'			
25							
					16	DROVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 25.0' TO 30.0' USING 300 16 HAMMER DROPPED 18"	
26					36		

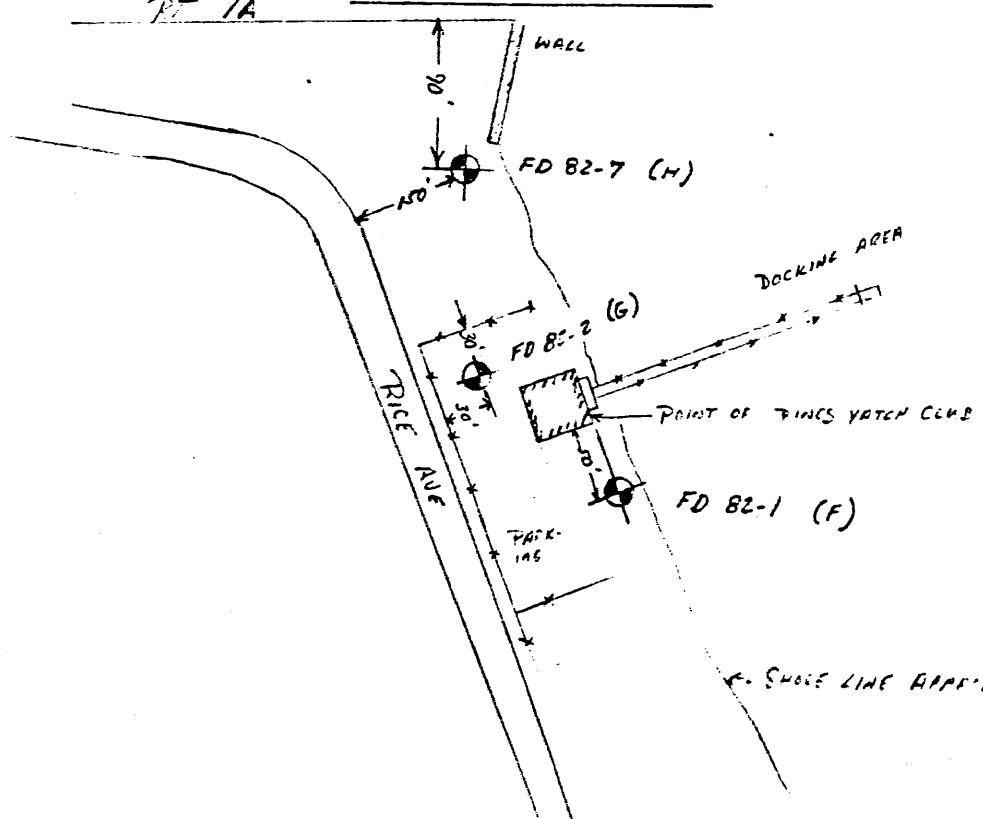


Site: REVERE, MA  
Boring No: FD 82-2

## SUBSURFACE WATER OBSERVATIONS

Note: Depths are in feet below original ground

## BORING LOCATION SKETCH



U.S. ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION

Site RIVER, MA

Page 1 of 3 Pages

FIELD LOG OF TEST BORING

Co-ordinates: N NOT GIVEN

E

Elevation Top of Boring 6.2' M.S.L. Hammer Wt. 300 lb Boring Started 8-25-82  
 Total Overburden Drilled 30.0' Feet Hammer Drop 18"  
 Elevation Top of Rock None Encountered M.S.L. Casing Left None Boring Completed 8-27-82  
 Total Rock Drilled -0- Feet Subsurface Water Data TIDAL Page         
 Elevation Bottom of Boring -23.8' M.S.L. Obs. Well ND  
 Total Depth of Boring 30.0 Feet Drilled By BRIGGS ENGINEERING & TESTING, CO.  
 Core Recovered N/A % No. Boxes - Mfg. Des. Drill ACKER  
 Core Recovered N/A Ft : - Diam. - In. Inspected By: RONALD F. BUKOSKI  
 Soil Samples 2-0 In. Diam. 10 No. Classification By: RONALD F. BUKOSKI  
 Soil Samples              In. Diam.        No. Classification By:             

0700  
0845 - 1000

0905

DEPTH	CORE/SAMPLE		BLOWS PER FT. CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1"=1.0' NO.	SIZE DEPTH RANGE			
1	S-1 1 JAR	2-0" 0.0 TO 2.0'	3	DRILLED 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 0.0 TO 5.0' USING 300 LB HAMMER DROPPED 18".	<u>SURFACE: BELOW SEA WALL ON SAND BEACH.</u> <u>SAND, FINE MEDIUM TO FINE SAND, &lt;2% NONPLASTIC FINES, DAMP TO SATURATED, LIGHT GRAY, (SP).</u>
2			11	RECOVERED 28-0".	
3	S-1A 1 JAR	2-0" 2.0 TO 5.0'	26	DRILLED 3-0" CASING FROM 0.0 TO 5.0' AND WASHED OUT USING ROLLER ROCK BIT.	<u>SILTY GRAVEL, COARSE TO FINE GRAVEL, 30-40% COARSE TO FINE SAND, 10-20% NOT TO SLIGHTLY PLASTIC FINES, SATURATED, LIGHT GRAYISH BROWN, (GM).</u>
4			27		
5	S-2 1/2	2-0" 5.0 TO 6.0'	18	DRILLED 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 5.0 TO 10.0' USING 300 LB HAMMER DROPPED 18".	<u>LAYERED GRAVEL &amp; SAND</u> <u>GRAVEL, MEDIUM TO FINE SUBROUNDED GRAVEL, 25-35% COARSE TO FINE SAND, &lt;5% NONPLASTIC FINES, GRAYISH BROWN, (GP).</u>
6			19		
7	S-2 2/2	2-0" 6.0 TO 10.0'	21	RECOVERED 26-0".	
8			24	DRILLED 3-0" CASING FROM 5.0 TO 10.0' AND WASHED OUT USING ROLLER ROCK BIT.	<u>SAND, FINE MEDIUM TO FINE SAND, &lt;2% NONPLASTIC FINES, GRAYISH BROWN, (SP).</u>
9					
10					

GENERAL REMARKS: BORING ELEVATIONS ARE REFERENCED TO EXISTING GROUND SURFACE ELEVATIONS.

8-25-82  
Rain

AED 1158 (Test)

Boring No. ED 82-3  
DESIG E

Site: FD-87-3						Boring No. FD-87-3 DESIG. E	Page 2 of 3
DEPTH BOLES ON CASING	CORE/SAMPLE NO.	SIZE IN. 2.0"	DEPTH RANGE TO 15.0'	BLOWS PER FT CORE REC'D	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS	
				12	DOVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 10.0 TO 15.0' USING 300 16 HAMMER DROPPED 18".	SAND, FINE MEDIUM TO FINE SAND, MOSTLY FINE SAND, < 5% NONPLASTIC FINES, LIGHT GRAYISH BROWN, (SP).	
14			10.0	12	RECOVERED 13-0"		
15	S-3	2.0"	7.0	14			
16	1 JAR		15.0'				
17				15	DOVE 3-0" CASING FROM 10.0 TO 15.0' AND WASHED OUT USING SIDE DISCHARGING CHOPPING BIT.		
18				25			
19							
20							
21							
22	S-4	2.0"	15.0'	6	DOVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 15.0 TO 20.0' USING 300 16 HAMMER DROPPED 18".	SAND WITH THIN LAYERS OF PEAT,	
23	1 JAR		7.0	6	RECOVERED 26-0"	SAND, FINE SAND, ± 10% NONPLASTIC FINES, GRAY (SP-SM).	
24			20.0'	9			
25							
26							
27							
28							
29							
30							
31							
32	S-5	2.0"	20.0'	8	DOVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 20.0 TO 25.0' USING 300 16 HAMMER DROPPED 18".	SAND, FINE MEDIUM TO FINE SAND, < 5% NONPLASTIC FINES, GRAY, (SP).	
33	1 JAR		23.5'	15	RECOVERED 23-0"		
34				15			
35							
36							
37							
38							
39							
40							
41	S-5A	2.0"	23.5'	19	DOVE 3-0" CASING FROM 20.0 TO 25.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	SILT CLAY, MODERATE PLASTICITY, MODERATE DRY STRENGTH, GRAY (CL).	
42	1 JAR		7.0				
43			25.0'	23			
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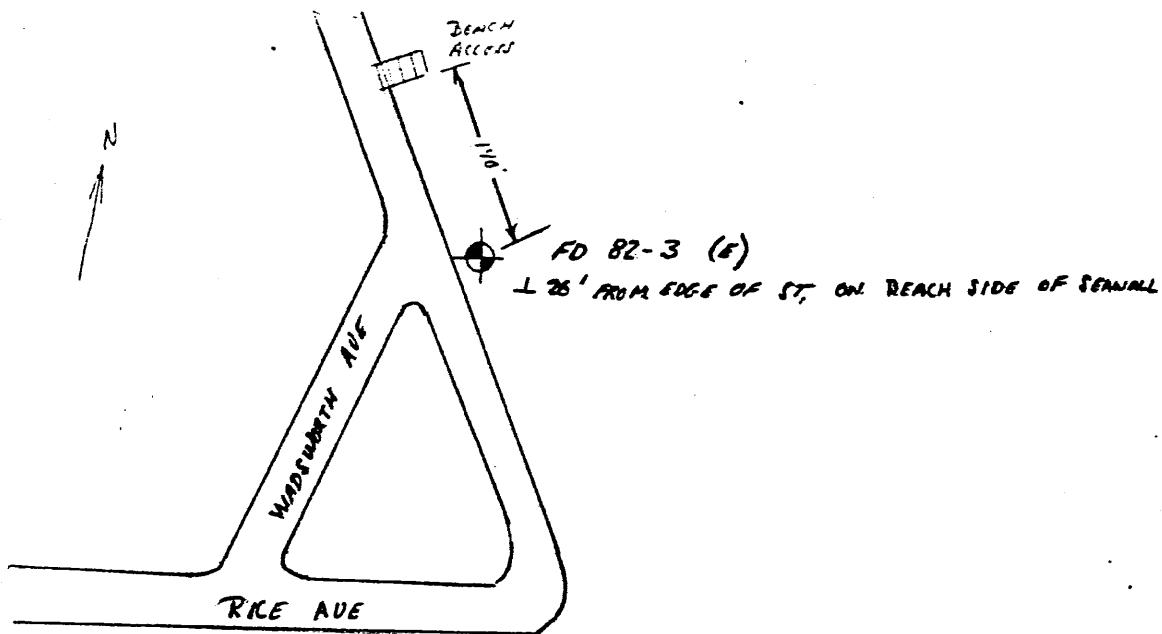
Boring No. FD 63-3  
DESIG. E

Site: REVERE, MA  
Boring No: FD 82-3

## SUBSURFACE WATER OBSERVATIONS

Note: Depths are in feet below original ground

**BORING LOCATION SKETCH**



U.S. ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION

Site TD 82-9

Page 1 of 3 Pages

FIELD LOG OF TEST BORING

Co-ordinates: N NOT GIVEN

E

Elevation Top of Boring 3.2' M.S.L. Hammer Wt. 300 lb Boring Started F-27-82  
 Total Overburden Drilled 30.0 Feet Hammer Drop 18"  
 Elevation Top of Rock None Encountered M.S.L. Casing Left None Boring Completed 9-3-82  
 Total Rock Drilled 0 Feet Subsurface Water Data \_\_\_\_\_ Page \_\_\_\_\_  
 Elevation Bottom of Boring - 26.8' M.S.L.  
 Total Depth of Boring 30.0' Feet Obs. Well NO TIDAL  
 Core Recovered N/A % No. Boxes — Drilled By TRIGGS ENGINEERING & TESTING CO.  
 Core Recovered N/A Ft : Diam. — In. Mfg. Des. Drill PTO CATHEAD - TRUCK MOUNT. TRIPED  
 Soil Samples 2-0 In. Diam. 12 No. Inspected By: RONALD F. BUKOSKI  
 Soil Samples In. Diam. No. Classification By: RONALD F. BUKOSKI  
 Classification By:

DEPTH $1' = 10'$	CORE/SAMPLE		BLOWS PER FT. CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO.	SIZE DEPTH RANGE			
1	S-1 2 JAE	2.0" TO 5.0'	0.0	5	DOVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 0.0 TO 5.0' USING 300 LB HAMMER DROPPED 18". RECOVERED 21-0".
2			5.0	12	
3			5.0	29	DOVE 3-0" CASING FROM 0.0 TO 5.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.
4			5.0	48	
5			5.0	47	
6	S-2 1 JAE	2.0" TO 7.5'	5.0	23	DOVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 5.0 TO 10.0' USING 300 LB HAMMER DROPPED 18". RECOVERED 21-0".
7			7.5	13	
8	APPROXIMATE CHANGE IN MAT.		10.0	14	DOVE 3-0" CASING FROM 5.0 TO 10.0' AND WASHED OUT USING SIDE DISCHARGING CHOPPING BIT.
9	S-2A 1 JAR	2.0" TO 10.0'	7.5	18	
10			10.0	18	
GENERAL REMARKS: BORING DEPTHS ARE REFERENCED TO EXISTING GROUND SURFACE.					

Site: EVERETT, WA						Boring No.: FD 82-4 Design: A	Page <u>2</u> of <u>2</u>
BINS ON CAGING	DEPTH	CORE/SAMPLE	BLWS. FT.	SAMPLING AND CORING OPERATIONS		CLASSIFICATION OF MATERIALS	
	P=1.0	NO.	SIZE	DEPTH INCHES	CORE REC'D.		
					33	DOVE 2-0" I.D. SOLID BARREL SAMPLER FROM 10.0 TO 15.0' USING 300 16 HAMMER DROPPED 18".	
	11			10.0	20	RECOVERED 24-0".	
	12	S-3 1 JAR	2.0"	15.0'	12	DOVE 3-0" CAGING FROM 10.0 TO 15.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	
	13				19		
	14				25		
	15				11	DOVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 15.0 TO 20.0' USING A 300 16 HAMMER DROPPED 18".	SAND WITH GRAVEL LAYER
	16			15.0			
	17	S-4 1 JAR	2.0"	17.0	8	RECOVERED 27" APPROXIMATELY	SAND, FINE MEDIUM TO FINE SAND, < 5% NON- PLASTIC FINES, GRAY, (SP).
	18			18.5	13	DOVE 3-0" CAGING FROM 15.0 TO 20.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	GRAVELLY SAND LAYER 15-25' MEDIUM TO FINE GRAVEL, MOSTLY FINE SAND, (SP).
	19			18.5	22		
	20	S-4A 2 JARS	2.0"	19.0	26	DOVE 2-0" I.D. SOLID BARREL SAMPLER FROM 20.0 TO 25.0' USING 300 16 HAMMER DROPPED 18".	SILTY CLAY, MODERATELY PLASTIC, GRAY, (CL).
	21				10		
	22	C-5 2 JARS	2.0"	20.0	10	RECOVERED 29.0" ON SECOND ATTEMPT.	SILTY CLAY, MODERATE PLASTICITY, GRAY, (CL).
	23			20.0'	14		
	24				15	WASHED OUT HOLE USING SIDE DISCHARGE CHOPPING BIT	
	25				18		
	26				6	DOVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 25 TO 30.0'	
	27				6		

SII

REVERE, MA

**Boring No.**

FD 82- 4

DESIG A

Page 3

of 3

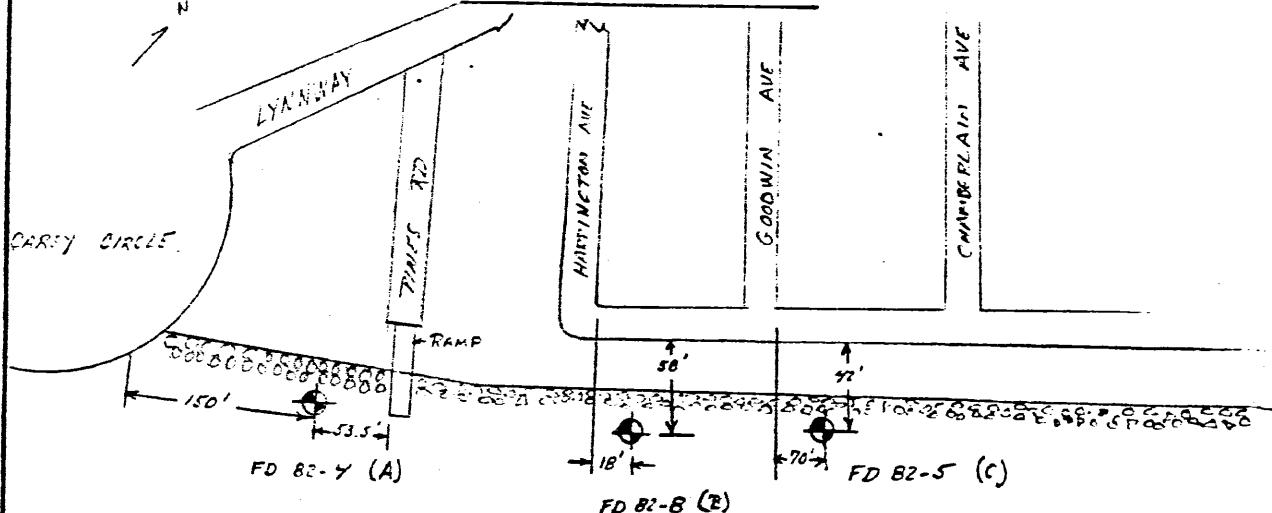
Site: REVERE, MA

Boring No: FD 82-4

## SUBSURFACE WATER OBSERVATIONS

Note: Depths are in feet below original ground

### BORING LOCATION SKETCH



U.S. ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION

Site FEVERE, MA

Page 1 of 3 Pages

Boring No. FD-82-5 Desig. C Diam. (Casing) 3-0"

FIELD LOG OF TEST BORING

Co-ordinates: N NOT SHOWN

E

Elevation Top of Boring 3.0' M.S.L. Hammer Wt. 300 lb Boring Started 8-30-82  
 Total Overburden Drilled 30.0' Feet Hammer Drop 18"  
 Elevation Top of Rock NONE ENCOUNTERED M.S.L. Casing Left NONE Boring Completed 8-30-82  
 Total Rock Drilled 0' Feet Subsurface Water Data TIDAL Page —  
 Elevation Bottom of Boring -27.0' M.S.L. Obs. Well NO  
 Total Depth of Boring 30.0' Feet Drilled By BRIGGS ENGINEERING & TESTING CO.  
 Core Recovered N/A % No. Boxes — Mfg. Des. Drill PTO-CATERPILLAR TRUCK MOUNT, TRIPOD  
 Core Recovered N/A Ft. Diam. — In. Inspected By: RONALD F. RUKACKI  
 Soil Samples 2-0 In. Diam. 9 No. Classification By: RONALD F. RUKACKI  
 Soil Samples — In. Diam. — No. Classification By: —

DEPTH 1"=10'	CORE/SAMPLE			BLOWS PER FT. CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO.	SIZE	DEPTH RANGE			
1				12	DROVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 0.0 TO 5.0' USING 300 LB HAMMER DROPPED 18".	SURFACE: GRAVELLY SAND BEACH.
2	S-1	2-0"	0.0 TO 5.0'	38	RECOVERED 26-0".	SANDY GRAVEL, MEDIUM TO FINE SUBGRADED GRAVEL, 30-40% COARSE TO FINE SAND, < 5% NONPLASTIC FINES, LIGHT GRAYISH BROWN, (GP).
3				47	DROVE 3-0" CASING FROM 0.0 TO 5.0' AND WASHED OUT USING SIDE DISCHARGING CHOPPING BIT. MEDIUM TO FINE GRAVEL IN WASH.	
4				57		
5				75		
6				17	DROVE 2-0" I.D. X 5.0' SOLID SPOON SAMPLER FROM 5.0 TO 10.0' USING 300 LB HAMMER DROPPED 18".	SAND, FINE MEDIUM TO FINE SAND, MOSTLY FINE SAND, < 5% NONPLASTIC FINES, LIGHT GRAYISH BROWN, (SP).
7	S-2	2-0"	5.0 TO 10.0'	20	RECOVERED 27-0".	
8				27	DROVE 3-0" CASING FROM 5.0 TO 10.0' AND WASHED OUT USING SIDE DISCHARGING CHOPPING BIT.	
9				24		
10				34		

GENERAL REMARKS: Boring depths are referenced to existing ground surface elevation.

Site: FIVEINE, MI					Boring No. FD 82-5 DESIG C	Page <u>2</u> of <u>2</u>
DEPTH feet on Casing	Core/Sample No.	Size inches	Depth inches	Blows per ft	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
11				9	DROVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 10.0 TO 15.0' USING 300/16 HAMMER DROPPED 18"	SAND WITH THIN LAYERS OF PEAT
12	S-3	2-0"	10.0 TO 15.0	10	RECOVERED 39-0"	SAND, MOSTLY FINE SAND, < 5% NONPLASTIC FINE, GRAY, (SP).
13	1 JAR			11	DROVE 2-0" CASING FROM 10.0 TO 15.0' AND WASHED OUT USING SIDE DISCHARGE CHIPPING BIT.	PEAT, THIN LAYERS < 1/8" THICK AT 1" INTERVALS, (PT).
14				17		SAND AT TIP OF SPOON SLIGHTLY COARSER WITHOUT PEAT.
15				27		
16	S-4	2-0"	15.0 TO 20.0	7	DROVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 15.0 TO 20.0' USING 300/16 HAMMER DROPPED 18"	SAND, MEDIUM TO FINE SAND, < 5% NONPLASTIC FINE, LIGHT GRAY, (SP).
17	1 JAR			16	RECOVERED 29-0"	
18				20	DROVE 2-0" CASING FROM 15.0 TO 20.0' AND WASHED OUT USING SIDE DISCHARGE CHIPPING BIT.	SILT CLAY, LOW TO MODERATE PLASTICITY, STIFF, BROWN WITH GRAY STREAKS, (CL)
19	S-4A	2-0"	18.0 TO 20.0	27		
20	1 JAR			31		
21					DROVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 20.0 TO 25.0' USING 300/16 HAMMER DROPPED 18"	SILT CLAY, MODERATE PLASTICITY, STIFFS, GRAY & BROWN STREAKS, (CL).
22	S-5	2-0"	20.0 TO 25.0	14	NO RECOVERY 1ST ATTEMPT.	
23	2 JAR			20	RECOVERED 26-0"	
24				21	WASHED OUT HOLE FROM 20.0 TO 25.0' USING SIDE DISCHARGE CHIPPING BIT.	
25				25		
26				6	DROVE 2-0" I.D. SOLID BARREL SAMPLER FRONT 25.0 TO 30.0' USING 300/16 HAMMER DROPPED 18"	
27				8		

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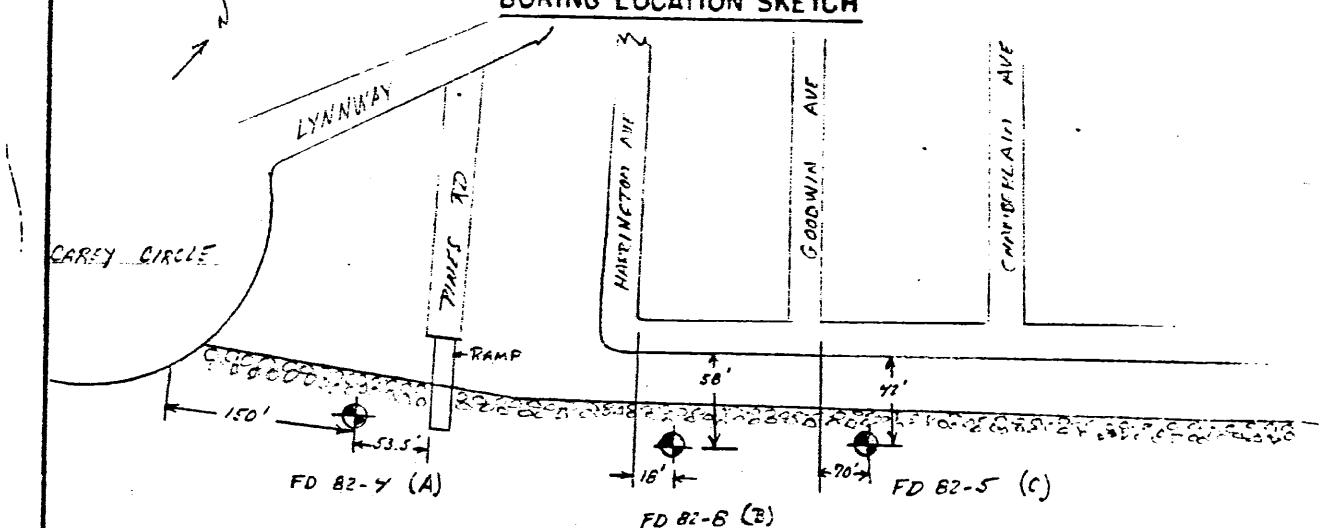
Boring No. FD B2-5  
Date. C

Site: REVERE, MA  
Boring No: FD 82-5

## SUBSURFACE WATER OBSERVATIONS

Note: Depths are in feet below original ground

### BORING LOCATION SKETCH



U.S. ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION

Site PELHAM, MA

Page 1 of 3 Pages

FIELD LOG OF TEST BORING

Boring No. FD-82-6 Desig. D Diam. (Casing) 2-0"

Co-ordinates. N NOT GIVEN E       

Elevation Top of Boring	<u>7.3</u>	M.S.L.	Hammer Wt.	<u>300 lb</u>	Boring Started	<u>8-27-82</u>
Total Overburden Drilled	<u>30.0</u>	Feet	Hammer Drop	<u>18"</u>		
Elevation Top of Rock <u>above ENCONTRERED</u>		M.S.L.	Casing Left	<u>NO Casing</u>	Boring Completed	<u>8-31-82</u>
Total Rock Drilled	<u>- 0 -</u>	Feet	Subsurface Water Data		Page	
Elevation Bottom of Boring	<u>22.7'</u>	M.S.L.	Obs. Well	<u>No</u>	9.0' TIDEAL	
Total Depth of Boring	<u>30.0'</u>	Feet	Drilled By	<u>BRIGGS ENGINEERING &amp; TESTING CO.</u>		
Core Recovered	<u>N/A</u> %	No. Boxes	Mfg. Des. Drill	<u>PTO - CATERPILLAR, TRUCK MOUNT, TRIPOD</u>		
Core Recovered	<u>N/A</u> Ft	Diam. In.	Inspected By:	<u>RONALD F. ZUKACKI</u>		
Soil Samples	<u>2-0</u>	In. Diam. <u>6</u> No.	Classification By:	<u>RONALD F. ZUKACKI</u>		
Soil Samples		In. Diam. No.	Classification By:			

DEPTH  1'=1.0'	CORE/SAMPLE		BLOWS PER FT. CORE REC'DY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO.	SIZE			
1			9	DOVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 0.0 TO 5.0' USING 300 lb HAMMER DROPPED 18".	SURFACE: SAND DUNE SAND WITH GRAVELLY SAND LAYERS:
2	S-1 1 JAR	2-0"	0.0 TO 5.0'	29 RECOVERED 16-0" ✓	SAND, MOSTLY FINE SAND < 10% SHELL FRAGMENTS, < 5% NONPLASTIC FINE, DRY TO MOIST, LIGHT GRAYISH BROWN, (SP).
3			26	DOVE 3-0" CASING FROM 0.0 TO 5.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	GRAVELLY SAND, MEDIUM TO FINE GRAVEL, MOSTLY FINE SAND, < 5% NONPLASTIC FINE, MOIST, LIGHT GRAYISH BROWN, (SP).
4			19		
5			11	DOVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 5.0 TO 10.0 USING 300 lb HAMMER DROPPED 18".	SAND, < 5% MEDIUM TO FINE GRAVEL, MOSTLY FINE SAND, 10-20% FINE SHELL FRAGMENTS, LIGHT GRAYISH BROWN, (SP).
6	S-2 1 JAR	2-0"	5.0 TO 10.0'	16 RECOVERED 17-0" ✓	
7			33		
8			40	DOVE 3-0" CASING FROM 5.0 TO 10.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	
9			39		
10					

GENERAL REMARKS:

Site 101 - REVERE, MA						Boring No.	Page <u>5</u> of <u>3</u>
DEPTH feet on TINING	DEPTH ft. 1.0' NO.	CORE/SAMPLE SIZE NAME	BLWS. DEPTH CORE RECV'D	SAMPLING AND CORING OPERATIONS		CLASSIFICATION OF MATERIALS	
11	S-3	2-0"	10.0 to 15.0'	14 23 34	DROVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 10.0 TO 15.0' USING 300lb HAMMER DROPPED 18". RECOVERED 16-0".	GREVELLY SAND, 10-15% COARSE TO FINE SURROUNDED GRAVEL, MOSTLY FINE SAND, 10-15% SHELL FRAGMENTS, <5% NONPLASTIC FINES, GRAY, (SP).	
12	1 JAR						
13							
14							
15							
16							
17	S-4	2-0"	15.0 to 20.0'	19 18 30	DROVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 15.0 TO 20.0' USING 300lb HAMMER DROPPED 18". RECOVERED 29-0".	SAND, FINE MEDIUM TO FINE SAND, MOSTLY FINE SAND, <5% SHELL FRAGMENTS, <5% NON- PLASTIC FINES, <5% FINE SURROUNDED GRAVEL, GRAY, (SP).	
18	1 JAR						
19							
20							
21							
22	S-5	2-0"	20.0 to 25.0'	10 16 23 29 31	DROVE 2-0" I.D. SOLID SPOON SAMPLER FROM 20.0 TO 25.0' USING 300lb HAMMER DROPPED 18". RECOVERED 26-0".	SAND WITH THIN LAYERS OF PEAT SAND, FINE MEDIUM TO FINE SAND, <5% NONPLASTIC FINES; GRAY, (SP).	
23	1 JAR						
24							
25							
26							
27							

8-21-82

Boring No. FD 82-6

DATA D

2000, DBA (Test)

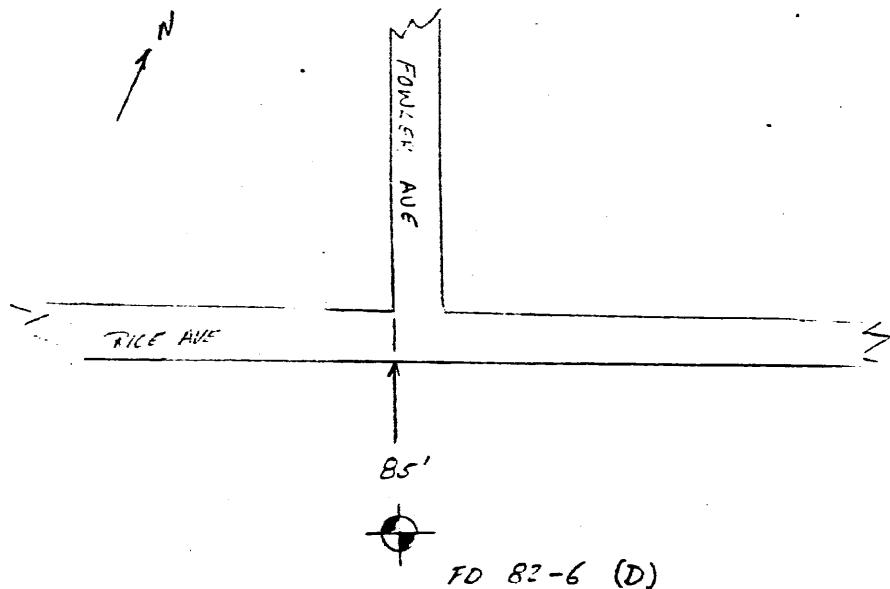


Site: REVERE, MA  
Boring No: FD 82-6

## SUBSURFACE WATER OBSERVATIONS

Note: Depths are in feet below original ground

**BORING LOCATION SKETCH**



U.S. ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION

Site REVERE, MA

Page 1 of 3 Pages

FIELD LOG OF TEST BORING

Co-ordinates: N NOT GIVEN

E

Elevation Top of Boring	6.5'	M.S.L.	Hammer Wt.	300 lb	Boring Started	E-31-82
Total Overburden Drilled	30.0'	Feet	Hammer Drop	18"		
Elevation Top of Rock	NONE ENCOUNTERED	M.S.L.	Casing Left	ALONE	Boring Completed	8-31-82
Total Rock Drilled	—0—	Feet				
Elevation Bottom of Boring	23.5'	M.S.L.	Subsurface Water Data		Page	
Total Depth of Boring	30.0	Feet	Obs. Well	NO	TIDAL	
Core Recovered	N/A %	No. Boxes	Drilled By	BRIGGS ENGINEERING & TESTING CO.		
Core Recovered	N/A ft	Diam. — in.	Mfg. Des. Drill	PTO-CATHEAD, TRUCK MOUNT, TRIDGE		
Soil Samples	2-0	In. Diam. 7 No.	Inspected By:	RONALD F. BUKOSKI		
Soil Samples	1-½	In. Diam. 1 No.	Classification By:	RONALD F. BUKOSKI		

DEPTH 1" = 1.0'	CORE/SAMPLE		BLOWS PER FT. CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	NO.	SIZE			
1	S-1 1 JAR	2-0"	0.0 TO 1.0'	9	DOVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 0.0 TO 5.0' USING 300 lb HAMMER DROPPED 18".
2				13	RECOVERED 23-0"
3	S-1A 1 JAR	2-0"	1.0 TO 5.0'	25	DOVE 3-0" CAVING FROM 0.0 TO 5.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.
4				22	
5				23	
6				21	DOVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 5.0 TO 10.0' USING 300 lb HAMMER DROPPED 18".
7	S-2 1 JAR	2-0"	5.0 TO 10.0'	24	RECOVERED 18"
8				28	DOVE 3-0" CAVING FROM 5.0 TO 10.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.
9				25	
10				19	

GENERAL REMARKS: BORING DEPTHS ARE REFERENCED TO THE EXISTING GROUND SURFACE.

Site 1 REVERE, MA					Boring No.	Page <u>2</u> of <u>3</u>
DEPTH BINS ON CASING	CORE/SAMPLE NO.	SIZE INCHES	DEPTH INCHES	BLOWS TO RECOVER	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
				9	DOVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 10.0 TO 15.0' USING 300 16 HAMMER DROPPED 18".	SAND WITH THIN LAYERS OF PEAT.
11	S-3	2-0"	10.0 TO 15.0'	9	RECOVERED 27-0" <sup>MED COMP</sup>	SAND, FINE MEDIUM TO FINE SAND, < 5% NONPLASTIC FINES, GRAY, (SP).
12	1 JAR			10	DOVE 3-0" CASING FROM 10.0 TO 15.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT	PEAT, THIN LAYERS < 1/16" THICK, APPROXIMATELY 1/2 TO 1" BETWEEN LAYERS, MODERATE ORGANIC ODOR, BROWN, (PT).
13				11		
14				12		
15				3	DOVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 15.0 TO 20.0" USING 300 16 HAMMER DROPPED 18".	SAND WITH THIN LAYERS OF PEAT, SAME AS SAMPLE S-3
16	S-4	2-0"	15.0 TO 20.0'	7	RECOVERED 30-0" <sup>YELLO</sup>	
17	1 JAR			7	DOVE 3-0" CASING FROM 15.0 TO 20.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	
18				12		
19				17		
20						
21	S-5	2-0"	20.0 TO 22.75'	4	DOVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 20.0 TO 25.0' USING 300 16 HAMMER DROPPED 18".	SAND, MEDIUM TO FINE SAND, < 5% NONPLASTIC FINES, 5-10% SHELL FRAGMENTS, < 5% INTERSPERSED PEAT, GRAY (SP).
22	1 JAR			4	RECOVERED 32-0" <sup>YELLO</sup>	
23	S-5A	2-0"	22.75 TO 25.0'	16	DOVE 3-0" CASING FROM 20.0 TO 25.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	CLAY, MODERATE PLASTICITY, STIFF, MOTTLED BROWN AND GRAY, (CL).
24	1 JAR			21		
25				13	DOVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 25.0 TO 30.0' USING 300 16 HAMMER DROPPED 18".	
26				24		
27						

1305

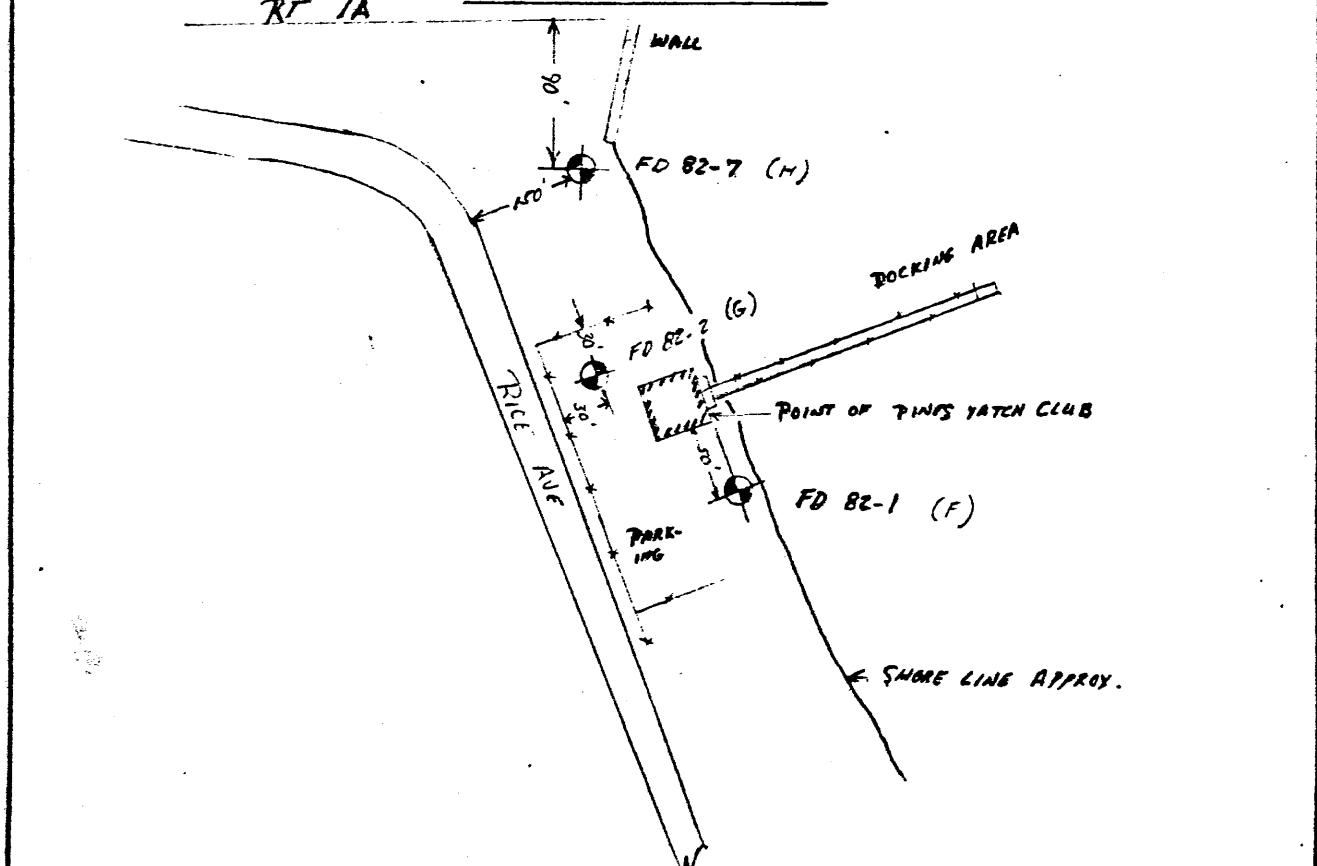


Site: REVERE, MA  
Boring No: FD A2-7

## SUBSURFACE WATER OBSERVATIONS

Note: Depths are in feet below original ground

## BORING LOCATION SKETCH



U. S. ARMY  
CORPS OF ENGINEERS  
NEW ENGLAND DIVISION

### Site

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## FIELD LOG OF TEST BORING

Co-ordinates. N 47° 6' 0"

Co-ordinates: N ~~NZ~~ SW 1/4 E

DEPTH	CORE/SAMPLE			BLOWS PER FT. CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1"±1.0"	NO.	SIZE DEPTH RANGE			
1	S-1 1 JAR	3-0"	0.0 TO 2.0'	13	DRIVE 2-0" I.D. X 5' SOLID SPROUT SAMPLER FROM 0.0 TO 5.0' USING 300 lb HAMMER DROPPED 18".	<u>SURFACE: SAND</u> <u>SAND AND SHELL FRAGMENTS</u> <u>COARSE TO FINE SAND, MIXED</u> <u>MEDIUM TO FINE, 25-35%</u> <u>SHELL FRAGMENTS, &lt;5%, NON-</u> <u>PLASTIC FINE, GRAYISH BROWN, (SP).</u>
2				15	RECOVERED 27-0" <i>NICE</i>	
3	S-1A 1 JAR	3-0"	2.0 TO 5.0'	12	DRIVEN 3-0" CASING FROM 0.0 TO 5.0' AND WASHED OUT USING SIDE DISCHARGE CHOPPING BIT.	<u>SAND, MIXED FINE MEDIUM</u> <u>TO FINE SAND, &lt;5% NON-</u> <u>PLASTIC FINE, THIN SCANT</u> <u>OF FINE GRAVEL, BROWN,</u> <u>(SP)</u>
4				16		
5				18		
6				8		
7	S-2 1 JAR	3-0"	5.0 TO 10.0'	11	DRIVEN 2-0" I.D. X 5' SOLID SPROUT SAMPLER FROM 5.0 TO 10.0' USING 300 lb HAMMER DROPPED 18".	<u>SAND, &lt;5% FINE GRAVEL,</u> <u>MOSTLY FINE MEDIUM TO</u> <u>FINE SAND, &lt;5% NONPLASTIC</u> <u>FINE, GRAY, (SP).</u>
8				16	RECOVERED 36-1/2" <i>NICE</i>	
9				22		
10				33		

GENERAL REMARKS: BORING DEPTHS ARE REF. TO  
EXISTING GROUND SURFACE ELEVATIONS.

Site: REVERE, MA					Boring No. FD 82-8 DESIG. D	Page <u>2</u> of <u>3</u>
DEPTH BONS ON TAPE	CORE/SAMPLE NO.	SIZE	DEPTH TO CORE RECOVERED	BLOWS PER FT.	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
					DROVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 10.0 TO 15.0' USING 300lb HAMMER DROPPED 18"	SAND, MEDIUM TO FINE SAND, < 5% NONPLASTIC FINES, GRAY, (SP).
11	S-3	2-0"	10.0 TO 15.0'	23		GRAVITY SLIGHTLY FINER AT THE TOP OF RECOVERED SAMPLE.
12	1 JAR			29	RECOVERED 18-0" Casing	
13				31	DROVE 2-0" CASING FROM 10.0 TO 15.0' AND WASHED OUT USING SIDE DISCHARGE CHIPPING BIT.	
14				26		
15				6	DROVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 15.0 TO 20.0' USING 300lb HAMMER DROPPED 18"	SILTY CLAY IN WASH AT 15.0'
16	NO REC G E E P Y			9		
17				9	NO RECOVERY - CASING DRIED BEFORE NO RECOVERY WAS DISCOVERED.	
18				13	DROVE 2-0" CASING FROM 15.0' TO 20.0' AND WASHED OUT USING SIDE DISCHARGE CHIPPING BIT.	
19				16		
20				6	DRAVE 2-0" I.D. X 5' SOLID SPOON SAMPLER FROM 20.0 TO 25.0 USING 300lb HAMMER DROPPED 18"	SILTY CLAY, MODERATE PLASTICITY, GRAY, (CL).
21	S-4	2-0"	20.0 TO 25.0'	9		
22	2 JARS			9		
23				10	RECOVERED 39" Casing	
24				14	WASHED OUT UNTIL NO CORE FROM 20.0 TO 25.0' USING SIDE DISCHARGE CHIPPING BIT.	
25				5	DROVE 2-0" I.D. X 5' SOLID BARREL SAMPLER FROM 25.0 TO 30.0' USING 300lb HAMMER DROPPED 18"	
26				7		
27						

**Site:** REVERE, MA

Boring No. FD 82-A

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DESIG. B

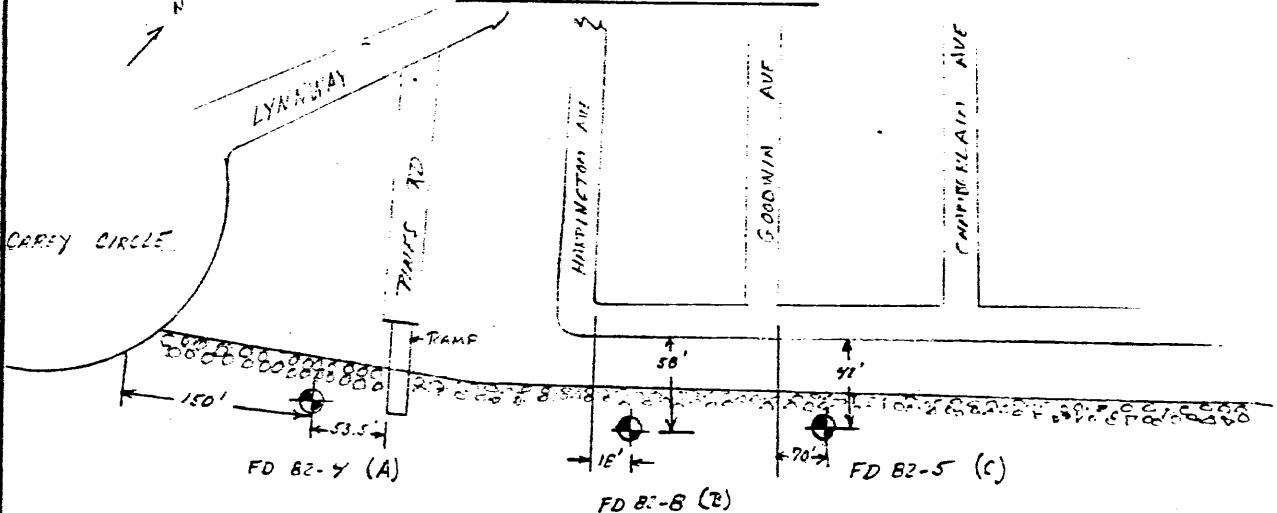
of 3

Site REVERE, MA  
Boring No. FD 82-8

## SUBSURFACE WATER OBSERVATIONS

Note: Depths are in feet below original ground

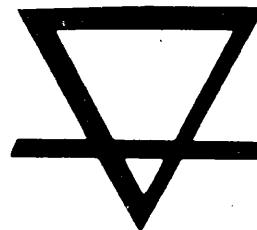
**BORING LOCATION SKETCH**



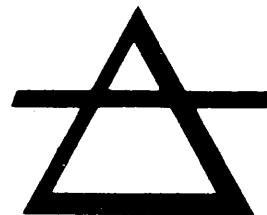


In ancient times  
Greek and Hindu philosophers  
believed that there were  
four elements in the material universe  
— EARTH, AIR, FIRE and WATER.

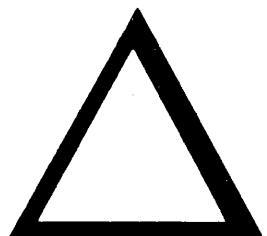
Over the years  
man's knowledge has expanded  
and the world of materials  
is now known to be extremely complex.  
The unravelling of these complexities  
is the continuing goal of  
Briggs Engineering & Testing Company.



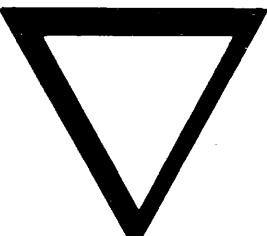
EARTH



AIR



FIRE



WATER

**BRIGGS**

Engineering and Testing

